Letter to the Editor

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L-index, more than a screening tool for hypertriglyceridemia

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To the Editor,

We read with interest the paper by Lippi et al. [1] dealing with serum indices. Serum indices, also conventionally known as HIL (hemolysis, icterus, lipemia), are simple, rapid, automated and inexpensive spectrophotometric measures widely used for assessing sample quality before clinical chemistry testing [2]. Concerning the use of the L-index (an index reflecting sample turbidity), the authors regarded the L-index as a surrogate measure for screening of hypertriglyceridemia.

In this respect, the enzymatic triglyceride test is regarded as a kind of clinical reference, whereas the turbidity is regarded as not specific for lipids [3]. The introduction of enzymatic triglyceride testing in the 1970s created the so-called "glycerol-error" in triglyceride testing. One milligram of free glycerol (molar mass: 92 g/mol) erroneously produces an absorbance equivalent with ±9 mg of triglycerides (molar mass: 885 g/mol). Even when this analytical error can be easily corrected, the vast majority of clinical laboratories have been using the non-glycerol-blanked tests [4]. Due to the limited demand, these glycerol-blanked tests will no longer be on the *in vitro* diagnostics market in the near future. The so-called false-negative prediction of hypertriglyceridemia by the L-index should be interpreted with caution when data points are outside the 95% confidence interval of the log(triglycerides)/L-index regression equation. Metabolic diseases such as glycerol kinase deficiency and glycerol-3-phosphate dehydrogenase 1 deficiency [5–7] can be detected by the combination of a low L-index and an apparent "hypertriglyceridemia" [8]. The apparent "false-negative" screening result based on the normal L-index in combination with an "increased" triglyceride value is actually a false-positive triglyceride result in these cases! The patient is often subjected to both aggressive nutritional and combination lipid-lowering drug treatment, which is ineffective. Eliminating interpretation errors in false hypertriglyceridemia and avoiding unnecessary treatment improve the benefit-to-harm ratio in triglyceride testing. Due to their size difference, triglyceride-containing plasma lipoproteins show a broad variation in their light scattering properties [9]. This light scattering is the physical basis of the L-index, whereas the triglyceride concentration results are independent of the size of the triglyceride-containing particles. Therefore, the ratio between the logarithmic transformed values of the triglycerides and the L-index is an estimate of the average particle size of triglyceride-containing particles [8].

In conclusion, the L-index should not solely be regarded as a screening test for hypertriglyceridemia or as a measure to verify the fasting state of a blood specimen, but as also that contains other clinically relevant information. Apart from the detection of rare metabolic disorders, in particular the log(triglycerides)/L-index may be useful in this respect. These insights should also persuade manufacturers and laboratorians to embark on a validation process for the HIL indices [2].

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